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09/992,250	11/14/2001	Steve H. Halfmann	170-99-X03	5824

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EXAMINER

VERDIER, CHRISTOPHER M

ART UNIT	PAPER NUMBER
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3745

DATE MAILED: 10/03/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/992,250

Applicant(s)

HALFMANN ET AL.

Examiner

Christopher Verdier

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-33 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 13-24 is/are allowed.
- 6) ☒ Claim(s) 1-5, 25-27 and 30-32 is/are rejected.
- 7) ☒ Claim(s) 6-12, 28, 29 and 33 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 November 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

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*Specification*

The abstract of the disclosure is objected to because it contains the phrases "The inventive" (line 7) and "The invention comprises" (line 9) which are implied and should be deleted. Correction is required. See MPEP § 608.01(b).

The disclosure is objected to because of the following informality: Appropriate correction is required.

On page 2, line 7, "a" should be deleted.

The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). None of the following claim limitations pertaining to the phrase "at least one" appear in the specification. It is suggested that Applicant amended the specification accordingly. Correction of the following is required:

Claim 1, line 6 recites at least one of the cooling circuits positioned to cool the pressure side wall.

Claim 1, lines 7-8 recite at least one other of the cooling circuits being positioned to cool the suction side wall.

Claim 4, lines 2-3, recite at least two of the cooling circuits positioned to cool the suction side wall.

Claim 5, lines 2-3 recite at least one cooling circuit positioned in the center of the interior.

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Claim 7, line 3 recites at least one turning vane.

Claim 13, lines 5-6 recite at least one of the cooling circuits positioned to cool the pressure side wall.

Claim 13, lines 7-8 recite at least one other of the cooling circuits being positioned to cool the suction side wall.

Claim 13, lines 11-12, recite at least two of the cooling circuits positioned to cool the suction side wall.

Claim 13, lines 14-15 recite at least one cooling circuit positioned in the center of the interior.

Claim 15, line 3 recites at least one turning vane.

Claim 21, lines 5-6 recite at least one of the cooling circuits positioned to cool the pressure side wall.

Claim 21, lines 7-8 recite at least one other of the cooling circuits being positioned to cool the suction side wall.

Claim 21, lines 11-12, recite at least two of the cooling circuits positioned to cool the suction side wall.

Claim 21, lines 14-15 recite at least one cooling circuit positioned in the center of the interior.

Claim 21, lines 19-20 recite at least one turning vane.

Claim 26, lines 2-3 recite positioning at least one of the cooling circuits adjacent the suction side wall.

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Claim 26, lines 4-5 recite positioning at least one of the cooling circuits adjacent the pressure side wall.

Claim 27, lines 2-3 recite positioning at least one of the cooling circuits in center of the interior.

Claim 29, lines 3-4 recite at least one turning vane.

### *Claim Objections*

Claims 4, 8-11, 30-31, and 33 are objected to because of the following informalities:  
Appropriate correction is required.

Claim 4 should end with a period.

In claim 30, line 5, "tips" should be changed to -- tip --.

In claim 33, line 2, "tuning" should be changed to -- turning --.

### *Claim Rejections - 35 USC § 112*

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 31 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In claim 31, lines 1-2, "the step of rensing cooling air after it cools said plenum" is unclear and ambiguous.

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***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-3, 5, 25-27, and 32 are rejected under 35 U.S.C. 102(b) as being anticipated by Corsmeier 5,813,835 (figures 4, 6, and 8). Note the air cooled turbine blade 10 having an airfoil shape 16 defined by a convex suction side wall 20, a concave pressure side wall 18, a leading edge 17, a trailing edge 19, a root 12, and an unnumbered tip, with the walls, edges, root and tip forming an interior for receiving blade cooling circuits, with plural independent cooling circuits within the interior, with one circuit 22 being positioned to cool the pressure side wall and another cooling circuit 24 being positioned to cool the suction side wall, with the plural cooling circuits comprising respective individual air inlets near 22, 24, with the cooling circuits being mechanically interconnected to one another via formation of the blade out of its material, with cooling circuit 26 positioned substantially in the center of the interior. Corsmeier also discloses the method of improving cooling effectiveness of the blade, by providing the plural independent cooling circuits and injecting cooling air into each cooling circuit through the respective independent air inlets. The suction side adjacent the cooling circuit has an out of plane serpentine bend near 50 (figure 7).

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Claims 1-4 and 25-26 are rejected under 35 U.S.C. 102(b) as being anticipated by United Kingdom Patent 1,257,041 (figures 7-8). Note the air cooled turbine blade having an airfoil shape 30 defined by a convex suction side wall near 32, an unnumbered concave pressure side wall, an unnumbered leading edge, an unnumbered trailing edge, a root 21, and an unnumbered tip, with the walls, edges, root and tip forming an interior for receiving blade cooling circuits, with plural independent cooling circuits within the interior, with one circuit 12 being positioned to cool the pressure side wall and another cooling circuit 12 being positioned to cool the suction side wall, with the plural cooling circuits comprising respective individual air inlets 24, 24, with the cooling circuits being mechanically interconnected to one another via formation of the blade out of its material. The United Kingdom Patent 1,257,041 also discloses the method of improving cooling effectiveness of the blade, by providing the plural independent cooling circuits and injecting cooling air into each cooling circuit through the respective independent air inlets.

Claims 25 and 27 are rejected under 35 U.S.C. 102(b) as being anticipated by Lee 5,660,524 (figures 2-3). Note the method for improving cooling effectiveness of air cooled turbine blade 10, with the blade having an airfoil shape 14 defined by a convex suction side wall 30, a concave pressure side wall 28, a leading edge 24, a trailing edge 26, a root 18, and a tip 32, with the walls, edges, root and tip forming an interior for receiving blade cooling circuits, comprising the steps of providing plural independent cooling circuits 88, 40/42/44, 86 within the interior, and injecting cooling air into each cooling circuit through respective unnumbered

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independent air inlets at the root (see figure 2). The cooling circuit at 44 is positioned substantially in the center of the interior.

Claims 25, 27, and 30 are rejected under 35 U.S.C. 102(b) as being anticipated by Levengood 4,753,575 (figures 1-2). Note the method for improving cooling effectiveness of air cooled turbine blade 10, with the blade having an airfoil shape 14 defined by a convex suction side wall 24, a concave pressure side wall 22, a leading edge 26, a trailing edge 28, a root 12, and a tip 16, with the walls, edges, root and tip forming an interior for receiving blade cooling circuits, comprising the steps of providing plural independent cooling circuits 46, 60, 74, 52 within the interior, and injecting cooling air into each cooling circuit through respective independent air inlets 44, 42, 40, 38 at the root. The cooling circuit at 74 is positioned substantially in the center of the interior. The cooling circuit 52 is positioned adjacent the leading edge and is formed such that a plenum 54 is provided for cooling the tip.

Claims 25 and 27 are rejected under 35 U.S.C. 102(b) as being anticipated by Amos 3,902,820 (figures 1-2 and 6). Note the method for improving cooling effectiveness of air cooled turbine blade 10, with the blade having an airfoil shape 12 defined by an unnumbered convex suction side wall, an unnumbered concave pressure side wall, an unnumbered leading edge, an unnumbered trailing edge, a root 18, and an unnumbered tip, with the walls, edges, root and tip forming an interior for receiving blade cooling circuits, comprising the steps of providing plural independent cooling circuits 20 within the interior, and injecting cooling air into each cooling



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circuit through respective unnumbered independent air inlets at the root (see figure 2). One of the cooling circuits 20 is positioned substantially in the center of the interior.

Claims 25, 27, and 30 are rejected under 35 U.S.C. 102(b) as being anticipated by Japanese Patent 6-137,102 (figure 1). Note the method for improving cooling effectiveness of air cooled turbine blade 1, with the blade having an unnumbered airfoil shape defined by an unnumbered convex suction side wall, an unnumbered concave pressure side wall, a leading edge near 3A, a trailing edge near 2B, a root 1, and a tip 5, with the walls, edges, root and tip forming an interior for receiving blade cooling circuits, comprising the steps of providing plural independent cooling circuits 3A, 3B, 3C within the interior, and injecting cooling air into each cooling circuit through respective independent air inlets 2A, 2B, 2C at the root. The cooling circuit at 3B is positioned substantially in the center of the interior. The cooling circuit 3A is positioned adjacent the leading edge and is formed such that a plenum near 2A' is provided for cooling the tip.

#### *Prior Art*

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

LaFleur, Hoff, and Beeck are cited to show turbine blades having various pin and rib features at the trailing edges.

Lee 6,234,753 is cited to show a turbine airfoil with a bypass channel.

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*Allowable Subject Matter*

Claims 13-24 are allowed.

Claims 6-12, 28-29, and 33 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

No meaningful determination may be made with regard to claim 33 because of its indefinite nature.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher Verdier whose telephone number is (703)-308-2638. The examiner can normally be reached on Monday-Friday from 10:00-6:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward K. Look can be reached on (703) 308-1044. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0861.



Christopher Verdier  
Primary Examiner  
Art Unit 3745

C.V  
September 26, 2003